Research Statement

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15-01-2015

Background
At SMU, I have been actively involved in pedagogy and practice research. I have established a synergistic relationship between the pedagogy focused and practice focused research. The following diagram shows the key areas of my work and the concerns that I have been addressing.

Research Areas

Pedagogy Focused Work
1. Developing Innovative and effective teaching methodologies and content for enterprise technology centred university level courses
   
   Enterprise systems design, implementation, and integration play a major role in automating and innovating business processes. However, teaching these concepts to undergraduate students is quite challenging due to lack of compiled content and the complexity of the tools. Over the last ten years, I have been experimenting with various approaches to develop both the content and methodologies for delivering courses that are focused on enterprise technology. Following are some examples of this theme of my research work.

2. Studying the effectiveness of industry IT skills frameworks, student outcomes and competencies for designing IS curriculum, measuring student performance and providing feedback
   
   I got interested in this area of work when I started to explore ways to improve student learning and provide better feedback to the students in my course. As the Associate Dean of Education, it was also my responsibility to drive continuous improvement and renewal of the SIS BSc (ISM) curriculum. In this context, I collaborated with SIS faculty Prof Ilse Baumgartner, SIS Senior Instructor Ms Joelle Ducrot along with external collaborators namely Prof Emanuel Grant, Department of Computer Science, University of Technology, Singapore.

Practice Focused Work
1. Enhancing business agility through the design and implementation of composite applications that leverage Business Process Management Systems and Enterprise Service Oriented Architecture. Furthermore, using the composite paradigm, develop smart processes through analytics, social media and gamification techniques
of North Dakota and Dr Mehdi Asgarkhani, CPIT, Christchurch. This work has two themes.

The first theme is directed towards investigating how course competencies can be used to effectively deliver and assess course content, and give valuable, timely feedback to students. The Course Life Cycle and Competency Framework is developed, which addresses the following five phases of a course, namely, content design, assessment design, content delivery and assessment, assessment feedback, and content review. The framework is implemented and evaluated in some SIS courses.

The second theme is directed towards exploring existing IT skills frameworks such as National Infocomm Competency Framework (NICF) developed by the Singapore Workforce Development Agency, Skills Framework for the Information Age (SFIA), etc., and applying them to curriculum design for tertiary IS/IT education. This work is still in its very early stages and I hope to continue working on this over the next few years.

**Practice Focused Work**

1. Enhancing business agility through the design and implementation of composite applications that leverage Business Process Management Systems and Enterprise Service Oriented Architecture. Furthermore, using the composite paradigm, develop smart processes through analytics, social media and gamification techniques.

Most large organizations have implemented enterprise systems (e.g. ERP, CRM) to automate business process and more recently this trend is also spreading rapidly to the small and medium sized organizations. Some of these organizations are currently facing major issues with enterprise systems, when implemented processes are to be changed due to customer demands, technology innovation, government regulations, etc. This is mainly because current enterprise systems have been designed such that “process best practices” have been hard-wired. Changing these processes require special expertise (e.g. understand programming in ABAP for SAP ERP processes) and considerable time to re-engineer the hard-wired processes. However the current enterprise software vendors and technology companies are attempting to incorporate Web services technologies into their solutions to meet the challenges of process agility in future. The next generation of ERP focus is on developing process platforms where parts of business processes are available as “services” and organizations can compose their processes by using the “services” as building blocks. Instead of having to write low-level code, the composition of services is achieved through a graphical user interface with drag-and-drop mechanism.

I am currently working on practice oriented research work that will investigate how to develop composite applications using enterprise services within enterprise systems. In the context of a process driven composite application, I intend to explore the following themes

1. How social media is integrated with business processes?
2. The use cases, challenges, benefits and architecture for enabling the execution of business transactions by leveraging real-time analytics.
3. Redesign of enterprise systems user experience using gamification techniques.
### Selected Publications and Outputs

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<th>Title</th>
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<td>&quot;Aligning Assessments with Competencies using Keyphrase Extraction&quot;</td>
<td>Venkataramanan (Venky) SHANKARARAMAN and Swapna GOTTIPATI</td>
<td>IEEE International Conference on Teaching, Assessment, and Learning for Engineering</td>
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<td>&quot;Skills Frameworks for Industry and IT Education Alignment: A Pilot</td>
<td>Mehdi ASGARKHANI and Venkataramanan (Venky) SHANKARARAMAN</td>
<td>TALE 2014, Wellington, New Zealand</td>
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<td>&quot;Experimenting with Gamification in the Classroom&quot;</td>
<td>Emanuel GRANT, Venkataramanan (Venky) SHANKARARAMAN, Jeremy</td>
<td>IEEE 6th International Conference on Engineering Education, Kuala Lumpur, Malaysia</td>
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<td>&quot;Learning Analytics Applied to Curriculum Analysis&quot;</td>
<td>Swapna GOTTIPATI and Venkataramanan (Venky) SHANKARARAMAN</td>
<td>Special Interest Group for Education of Association of Information Systems (SIGED:</td>
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<td>&quot;Analyzing Course Competencies: What can Competencies Reveal about</td>
<td>Swapna GOTTIPATI and Venkataramanan (Venky) SHANKARARAMAN</td>
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<td>&quot;Case studies in computing education: presentation, evaluation and</td>
<td>Ilse BAUMGARTNER and Venkataramanan (Venky) SHANKARARAMAN</td>
<td>IEEE 44th Annual Frontiers in Education (FIE) Conference, Madrid, Spain</td>
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<td>&quot;Skills Frameworks: A Tool for Reform in Information Technology</td>
<td>Mehdi ASGARKHANI and Venkataramanan (Venky) SHANKARARAMAN</td>
<td>IEEE 9th International Conference on Computer Science and Education, Vancouver</td>
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<td>&quot;Structure of face-to-face teaching sessions for an undergraduate</td>
<td>Ilse BAUMGARTNER and Venkataramanan (Venky) SHANKARARAMAN</td>
<td>IEEE Global Engineering Education Conference (EDUCON 2014), Istanbul, Turkey</td>
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<td>&quot;Opportunities and Challenges in Using Competencies during Design</td>
<td>Venkataramanan (Venky) SHANKARARAMAN and Joelle DUCROT</td>
<td>27th IEEE Conference on Software Engineering Education and Training, Klagenfurt,</td>
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<td>&quot;Case studies in computing education: presentation, evaluation and</td>
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